

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/11166

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : B01D 53/22,71/02

US CL : 95/55,56

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 95/55,56;96/4,10,11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| A          | US 3,450,500 A (SETZER et al.) 17 June 1969 (17.06.69).                            | 1-12                  |
| A          | US 3,901,668 A (SEITZER) 26 August 1975 (26.08.75).                                | 1-12                  |
| A          | US 4,019,868 A (SEBACHER et al.) 26 April 1977 (26.04.77).                         | 1-12                  |
| A          | US 4,120,663 A (FALLY) 17 October 1978 (17.10.78).                                 | 1-12                  |
| A          | US 4,254,086 A (SANDERS) 03 March 1981 (03.03.81).                                 | 1-12                  |
| A          | US 4,810,485 A (MARIANOWSKI et al.) 07 March 1989 (07.03.89).                      | 1-12                  |
| A          | US 6,033,632 A (SCHWARTZ et al.) 07 March 2000 (07.03.00).                         | 1-12                  |
| A          | US 6,468,684 B1 (CHISHOLM et al.) 22 October 2002 (22.10.02).                      | 1-12                  |
| A,E        | US 6,569,226 B1 (DORRIS et al.) 27 May 2003 (27.05.03).                            | 1-12                  |



Further documents are listed in the continuation of Box C.



See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

25 June 2003 (25.06.2003)

Date of mailing of the international search report

07 AUG 2003

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**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| A          | US 2001/0001379 A1 (WACHMAN et al.) 24 May 2001 (24.05.01).                        | 1-12                  |